## REMARKS

Claims 1-14, and 23-28 are pending in the present application. Claim 12 has been amended for the purpose of better defining the invention, Claim 13 has been canceled, and Claims 29 and 30 have been added, leaving Claims 1-12, 14, and 23-30 for consideration upon entry of the present amendment. Antecedent basis for new Claims 29 and 30 is found for example in Figures 1, 4, and 5. The specification has been amended at page 4, lines 11-16, page 6, line 7, page 7, lines 6-12, page 7, lines 19-24, and page 8, lines 11-18. Antecedent basis for the amendments to the specification may be found for example in the specification, page 5, lines 3 and 17, Claims 12 and 13, and Figure 5. No new matter has been introduced by the amendments. Reconsideration and allowance is respectfully requested in view of the above amendments and the following.

### Drawings

The drawings have been objected to based upon errors appearing in Figure 5 and the failure to show an 'air inlet'. Figure 5 has been amended to correct the errors, Claim 12 has been amended to remove reference to an 'air inlet', and Claim 13 has been cancelled. Applicant respectfully requests reconsideration of the drawings given these amendments.

### Specification

The disclosure has been objected to regarding certain informalities appearing therein. Applicant has amended the specification to insert -- annular opening -- before "34" and to include -- annular ring -- before "32", and thus respectfully request reconsideration given these amendments. Additionally, Applicant has reviewed the specification for minor errors as requested by the Examiner.

### Claim Rejections

Claims 2-5, 12-13, 14, 28 stand rejected under 35 U.S.C. §112, second paragraph as allegedly being indefinite for failing to particularly point out and distinctly claim the subject matter. Applicant has amended Claim 12 to remove the reference to "an air inlet"

and have cancelled Claim 13. Reconsideration is respectfully requested given the amendments.

However, regarding Claim 2, Applicant submits that the phrase "a first annular end portion of said catalyst" finds proper support in the specification and drawings. In the specification, page 5, lines 1-4, it is disclosed that the endplates may have optional annular rings, which are to be secured around the annular ends of the catalyst substrate. The annular rings and the annular ends of the catalyst substrate are shown in Figure 1, such that the annular rings 32 are secured around the annular ends of catalyst substrate 20. As such, the requirements of 35 U.S.C. §112 have been met and reconsideration of Claim 2 is requested.

Similarly, Applicant submits that the subject matter of Claims 14 and 28 find proper support in both the specification and drawings. In Claim 14, the first end plate has a periphery and the shell extends about halfway across the periphery. In Claim 28, the shell extends from about halfway across the periphery of the first endplate to about halfway across the periphery of the second endplate. In the specification, page 8, lines 11-18 it is disclosed that to facilitate securing the shell to the end plates, the shell preferably has a length less than the overall length of the catalytic converter, and the shell extends from a point on one end plate to a point on the opposing endplate. The points are preferably disposed near the middle of the periphery of each end plate. The specification has been amended to correct reference to Figure 5 instead of Figure 6. Figure 5 clearly shows points 36 and 38 located on the periphery of the endplates, each point being disposed near the middle of the periphery. Applicant thus submits that the requirements of 35 U.S.C. §112 have been met, and respectfully request reconsideration of Claims 14 and 28.

Claims 1-3, 5-8, 10, 23-27 stand rejected under 35 U.S.C. §102(b) as allegedly unpatentable over U.S. Patent No. 4,043,761 to Gaysert et al. Claims 1-3, 6-8 stand rejected under 35 U.S.C. §102(b) as allegedly unpatentable over U.S. Patent No. 3,854,888 to Frietzsche et al. Claims 1-3, 5-7, 10-11 stand rejected under 35 U.S.C. §102(b) as allegedly unpatentable over U.S. Patent No. 3,841,842 to Wiley. Claims 1-3, 6-8 stand rejected under 35 U.S.C. §102(b) as allegedly unpatentable over U.S. Patent

No. 4,432,943 to Musall et al. Claims 1-3, 5-8, 10 stand rejected under 35 U.S.C. §102(b) as allegedly unpatentable over U.S. Patent No. 4,155,980 to Santiago et al. Claims 1-3, 5-8, 10, 23-27 stand rejected under 35 U.S.C. §102(b) as allegedly unpatentable over U.S. Patent No. 5,250,269 to Langer. Claims 1-3, 5-8, 10, 23-27 stand rejected under 35 U.S.C. §102(b) as allegedly unpatentable over U.S. Patent No. 5,693,295 to Foster. Claims 4, 9, 11-14, 28 stand rejected under 35 U.S.C. §103(a) as allegedly unpatentable over either Foster, Langer, Santiago et al., Musall et al., Wiley, Frietzsche et al., or Gaysert et al. in view of either U.S. Patent No. 4,278,639 to Tadokoro et al. or U.S. Patent No. 3,967,929 to Tamazawa et al. and either U.S. Patent No. 3,832,443 to Hass or U.S. Patent No. 3,441,381 to Keith et al. Applicant respectfully traverse these rejections on the grounds that the above-cited references fail to teach all of the elements of Applicant's amended independent Claims 1 and 24.

Applicant's independent Claim 1 is directed to an exhaust system converter, comprising a catalyst, a first endplate, positioned adjacent to a first end portion of the catalyst, a mat support, and a shell. Applicant's amended independent Claim 24 is directed to an exhaust gas system converter comprising a catalyst, a first endplate, positioned adjacent to a first end portion of the catalyst, a second endplate, positioned adjacent to a second end portion of the catalyst, a mat support, and a shell. None of the above-cited references teach or suggest an exhaust system converter including a catalyst, either a first, or a first and a second endplate, each positioned adjacent to an end portion of the catalyst, and a shell.

Gaysert et al. disclose a catalytic converter comprising a catalyst carrier 1, a housing 7, a thermal insulation 8, and angle-shaped bearing members 9 and 10 (Col. 3, lines 63-64; Col. 4, lines 21-23, and 33-34). The Examiner contends that the housing 7 (or shell) is disposed around and in intimate contact with the angle-shaped bearing member 9 and 10 (or endplate). Applicant disagrees with the Examiner's assertions. Gaysert et al. do not teach or suggest a first, or a first and a second endplate as is required by Applicant. The angle-shaped bearing members 9 and 10 are not endplates, but form an integral part of an end cone assembly. Figures 2 and 3 clearly show angle-shaped bearing members 9 and 10 in conjunction with transition pieces 16 and 18 as end cone

assemblies. As such, Gaysert et al. do not teach or suggest a first, or a first and a second endplate.

Frietzsche et al. disclose a device for the purification of waste gases including a housing 1, a monolith 2, a support ring 8 and an annular space 10. (Col. 3, line 42-Col. 4, line 29) The Examiner contends that the housing 1 (or shell) is disposed around and in intimate contact with at least a portion of support ring 8 (or first endplate). Applicant disagrees with the Examiner's assertions. Frietzsche et al. do not teach or suggest a first, or a first and a second endplate, as is required by Applicant. The support ring 8 is not an endplate, but is an integral part of an end cone assembly. Frietzsche et al., Figure 1 and enlarged section Figure 2, clearly show support ring 8, in conjunction with extension 4 (of a frustoconical shape that tapers down to a tubular diameter) to form an end cone. (Col. 3, lines 43-45) As such, Frietzsche et al.do not teach or suggest a first, or a first and a second endplate.

Wiley discloses a catalytic converter including a core member 11, a housing or casing 16, laminated bimetal dish-like annuluses 17 and 18, ring or washer 20, and resilient compressible thermal resistant material 21. (Col. 2, line 44-Col. 3, line 42) The Examiner contends that Wiley discloses a system comprising a laminated bimetal dish-like annulus 18 and ring or washer 20 (forming a first endplate), and housing or casing 16 (or shell) disposed around and in intimate contact with at least a portion of the laminated bimetal dish-like annulus 18 (or first endplate). Applicant disagrees with the Examiner's assertions. Wiley does not teach or suggest a first, or a first and a second endplate, as is required by Applicant. The laminated bimetal dish-like annulus 18 is not an endplate, but is an integral part of an end cone assembly. Wiley, Figure 2 clearly shows the laminated bimetal dish-like annulus 18 in conjunction with metallic casing 15 (with a large open end rim portion 15a that tapers to a smaller diameter portion 15b) forming an end cone. (Col. 2, lines 44-59) As such, Wiley does not teach or suggest a first, or a first and a second endplate.

Mussall et al. disclose a catalyzer including a metallic housing 1, a catalyst body 7, an angular ring 11, and an annular space 13. (Col. 2, lines 44-57) The Examiner

contends that Mussall et al. disclose a system comprising a metallic housing 1 (or shell) and an angular ring 11 (or endplate) wherein the metallic housing 1 (or shell) is disposed around and in intimate contact with at least a portion of the angular ring 11 (or endplate). Applicant disagrees with the Examiner's assertions. Mussall et al. do not teach or suggest a first, or a first and a second endplate, as is required by Applicant. The angular ring 11 is not an endplate, but is an integral part of an end cone assembly. Mussall et al., Figure 1, clearly shows angular ring 11 in conjunction with end wall 8 and collar 9 forming an end cone. As such, Mussall et al. do not teach or suggest a first, or a first and a second endplate.

Santiago et al. disclose an apparatus for catalytic purification including a catalyst body 1, a resilient envelope 2, a housing 3, and a ring 5. The Examiner contends that Santiago et al. disclose a system comprising a ring 5 (or endplate) and a housing 3 (or shell), wherein the housing 3 (or shell) is disposed around and in intimate contact with at least a portion of the ring 5 (or endplate). Applicant disagrees with the Examiner's assertions. Santiago et al. do not teach or suggest a first, or a first and a second endplate, as is required by Applicant. The ring 5 is not an endplate, but is an integral part of an end cone assembly. Santiago et al., Figure 1, clearly shows ring 5 in conjunction with outer end section 6 and arched portion 7 forming an end cone. As such, Santiago et al. do not teach or suggest a first, or a first and a second endplate.

Langer discloses a catalytic converter including a cylindrical canister 12, a monolith 15, a mat 16, an inner metal wall 19, and a mat 20. (Col. 4, lines 26-40) The Examiner contends that Langer discloses a system comprising inner metal wall 19 (or endplate) and cylindrical canister 12 (or shell), wherein cylindrical canister 12 (or shell) is disposed around and in intimate contact with at least a portion of inner metal wall 19 (or endplate). Applicant disagrees with the Examiner's assertions. Langer does not teach or suggest a first, or a first and a second endplate, as is required by Applicant. The inner metal wall 19 is not an endplate, but is an integral part of an end cone assembly. Langer, Figure 1, clearly shows inner metal wall 19 forming an end cone. As such, Langer, does not teach or suggest a first, or a first and a second endplate.

Foster discloses a catalytic converter including an inner end cone 114, an insulating intumescent material 118, and a canister 120. (Col. 5, lines 39-55) The Examiner contends that Foster discloses a system comprising inner end cone 114 (or a first endplate) and canister 120 (or shell), wherein canister 120 (or shell) is disposed around and in intimate contact with at least a portion of inner end cone 114 (or a first endplate). Applicant disagrees with the Examiner's assertions. Foster does not teach or suggest a first, or a first and a second endplate, as is required by Applicant. The inner end cone 114 is not an endplate, but is an integral part of an end cone assembly. Foster, Figure 2, clearly shows inner end cone 114 forming an end cone, not an end plate. As such, Foster does not teach or suggest a first, or a first and a second endplate.

In regard to Tadokoro et al., Tamazawa et al., Hass, and Keith et al., Tadokoro et al. disclose a catalytic converter including a casing having generally frusto-conical metallic end closure members, catalyst carriers, and a cushioning layer. (Col. 1, line 42-Col. 2, line 28) As is clearly shown in Tadokoro et al., Figure 4, frusto-conical metallic end closure member 12 forms an end cone. Tamazawa et al. disclose an exhaust gas purifying system including a catalyst bed and a cylindrical casing comprising a conical casing, such that the catalyst bed is supported in the cylindrical casing between the conical casings. (Col. 2, lines 16-22, and as shown in Figure 2) Tamazawa et al., Figure 2, clearly shows posterior casing 23 forming an end cone. Tamazawa et al., Figure 4, does not show the use of end cones, however they teach air inlet 63, cooling passage 76, and air passage 78 which all serve to simulate the air flow characteristics of an end cone, as may be easily seen by comparison with the air flow out of the catalyst shown in Figure 3. Further, Tamazawa et al., Figure 4 do not teach a mat support as is required by Applicant. According to the teachings of Tamazawa et al. it would not be practical to include a mat support, as the cooling passage 76, shown in Figure 4 running parallel to the length of catalyst 65, is intended to cool catalyst 65 by having air pumped through it. (Col. 4, lines 17-21) As such, a mat support would only provide an undesired insulating property. Hass discloses an exhaust gas conversion process wherein air pollutants may be removed without the need for the recycling of exhaust gas. (Col. 1, lines 37-42) There is no teaching of an endplate. Keith et al. disclose an apparatus for purifying

exhaust gasses including a metallic casing, a catalyst, and frusto-conical metallic end closure members. (Col. 3, lines 19-44) Keith et al., Figure 3 clearly shows frusto-conical metallic end closure members 12 and 13 forming end cones. Thus, none of the above-cited references teach or suggest a converter having a first, or a first and second endplate.

To anticipate a claim under 35 U.S.C. §102, a single source must contain all of the elements of the claim. *Lewmar Marine Inc. v. Barient, Inc.*, 827 F.2d 744, 747, 3 U.S.P.Q.2d 1766, 1768 (Fed. Cir. 1987), *cert. denied*, 484 U.S. 1007 (1988).

For an obviousness rejection to be proper, the Examiner must meet the burden of establishing a prima facie case of obviousness. *In re Fine*, 5 U.S.P.Q.2d 1596, 1598 (Fed. Cir. 1988). Establishing a prima facie case of obviousness requires that all elements of the invention be disclosed in the prior art. *In Re Wilson*, 165 U.S.P.Q. 494, 496 (C.C.P.A. 1970).

For at least the reason that none of the above-cited references teach or suggest a converter having a first, or a first and a second endplate, Claims 1 and 24 are both not anticipated and non-obvious over the references. Further, as dependent claims from allowable independent claims, Claims 2-13, 23, and 25-26 are, by definition, also allowable.

Further, Applicant asserts that it would be non-obvious to employ a first, or a first and a second endplate in an exhaust system converter, wherein a shell is disposed around and in intimate contact with at least a portion of the first, or the first and the second endplate. All the cited references disclosing end cone assemblies rather than endplates are illustrative of the fact that it is non-obvious to employ endplates on an exhaust system converter. More specifically, end cones are generally applied to achieve and maintain the desired flow characteristics in a converter. It would not have been obvious to an artisan that desired flow could be obtained with endplates. Yet, the use of a first, or a first and a second endplate in an exhaust system converter, provides the desired exhaust flow within the converter. Furthermore, disposing the shell around the endplate simplifies manufacturing. As such, use of a first, or a first and a second endplate in an exhaust system converter, and/or with a shell disposed around and in intimate contact with at least a portion of the first, or the first and the second endplate, is non-obvious.

The above remarks and amendments are believed to fully comply with the Office Action. Reconsideration and withdrawal of the rejections and allowance of the claims is respectfully requested.

If there are any additional charges with respect to this Amendment or otherwise, please charge them to Deposit Account No. 06-1130 maintained by Applicant's Attorneys.

Respectfully submitted,

MYERS

CANTOR COLBURN LLP
Applicant's Attorneys

By: 
Michael J. Chang
Registration No. 46,611

Date: April 3, 2002
Customer No.: 23413
Phone: (860) 286-2929

## MARKED-UP VERSIONS OF CLAIMS AND SPECIFICATION

IN THE SPECIFICATION: Please amend the specification as follows, illustrated below in "marked-up" format:

Page 4, lines 11-16:

Thus, exhaust gas is catalytically treated as it flows through the substrate material within the catalytic converter. The substrate 20 may contain any catalyst material sufficient to convert fuel rich gasses to acceptable levels as is known in the art. Preferably, substrate 20 is coated with three-way catalysts to convert nitrous oxides, carbon monoxide, and hydrocarbons to nitrogen, water, and carbon dioxide. Optionally, the substrate 20 may contain an oxidation catalyst.

Page 5, lines 20-29:

The particularly preferred structural support for securing an end plate 30 to a substrate 20 prior to size reduction of an outer shell 50 to the assembly is a securing mechanism 32 affixed to an inner side of the end plate. The securing mechanism 32 is made of a material suitable for use in high temperature environments and is of a diameter greater than that of the catalyst substrate 20. This allows for the securing mechanism 32, which can have any appropriate geometry such as annular, conical, cylindrical or other, to extend around an annular end portion of the substrate 20, as is shown in Figure 1, forming a gas shield to protect optional insulation material in the annulus of the end plenum 64 area.

Page 6, line 7:

Figures 2 and 3 show a preferred shape and design for end plates used with the present invention. The catalytic converter design of the present invention advantageously allows for construction of a compact, cleanly assembled converter using the preferred, flat end plates. Each of these preferred endplates has, defined at any point within the plate, ~~a hole~~annular opening 34 for connection with exhaust piping (not shown) carrying exhaust gasses. Further, each endplate preferably has, welded or otherwise permanently affixed to an outer periphery of one side of the flat end plate, an annular ring 32. In this, annular ring 32 may be affixed to an endplate by any known method, but is preferably securely affixed by tack welding.

Page 7, lines 6-12:

Where the preferred end plate support mechanisms (or annular ring) 32 ~~are~~ is used, the mat 40 is wrapped over at least the portion of the support mechanism 32 extending around the annular end of the substrate 20 such that the mat 40 holds the extended portion between the mat and the substrate. This orientation functions to hold the end plates in a particular position and orientation prior to insertion of the wrapped assembly (substrate, end plates and mat) into an oversized shell 50.

Page 7, lines 19-24:

Intumescent mat 40 is preferably wrapped in a sufficient width to fully insulate ~~the~~ end plenums 64 of the converter at operating temperatures thereby providing lifetime and durability to those portions of the converter. As such, intumescent mat ~~30~~ 40 should, in the particularly preferred embodiment utilizing an annular ring 32, substantially cover all of the annular ring (shown in Figure 4).

Page 8, lines 11-18:

Shell 50 may then be welded along the end plate seam to ensure converter integrity. In order to facilitate welding or otherwise securing the shell 50 to the end plates, as can be seen in Figure ~~6~~5, the shell 50 preferably has a length less than the overall length of the catalytic converter. Essentially, the shell 50 preferably extends from point 36 on one end plate to point 38 on the opposing end plate. Points 36 and 38 can be located anywhere on the outer periphery of the end plates, with the points being disposed near the middle of the periphery typically preferred.

IN THE CLAIMS: Please amend Claim 12 as follows, illustrated below in "marked-up" format:

12. (Amended/Marked-up) The exhaust system converter of claim 1, ~~further comprising an air inlet, provided through said shell and said mat, and~~ wherein said catalyst comprises an oxidation catalyst.

FIG. 1

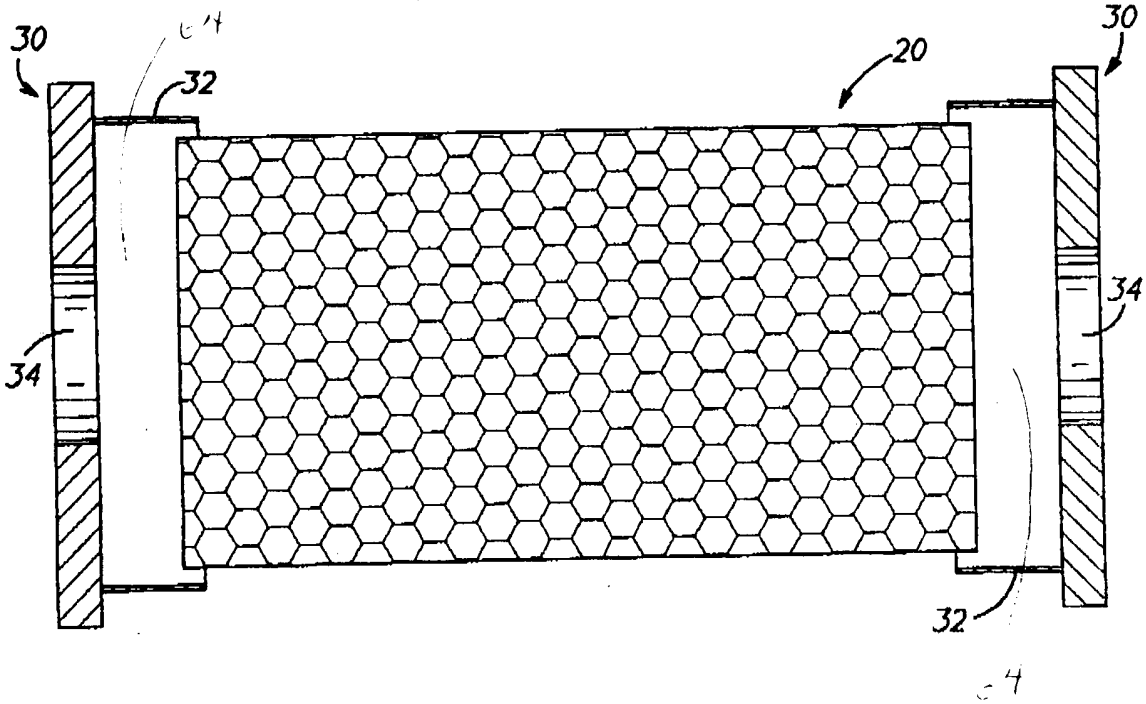


FIG. 2

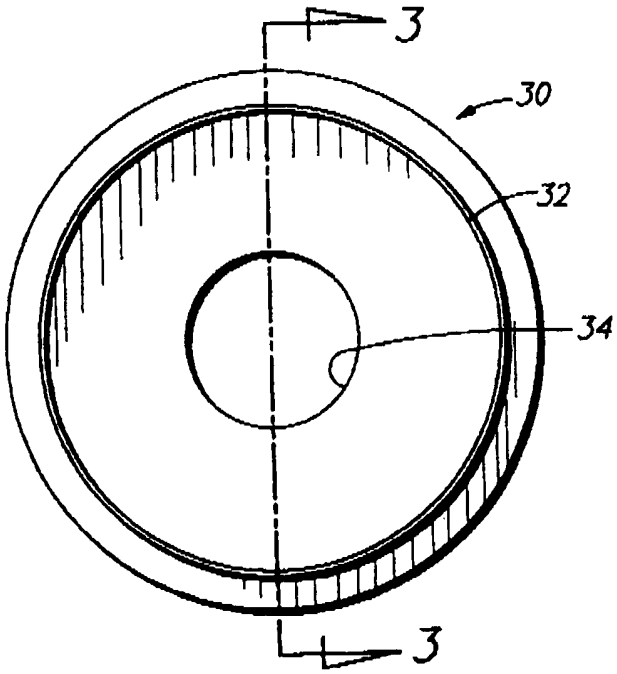


FIG. 3

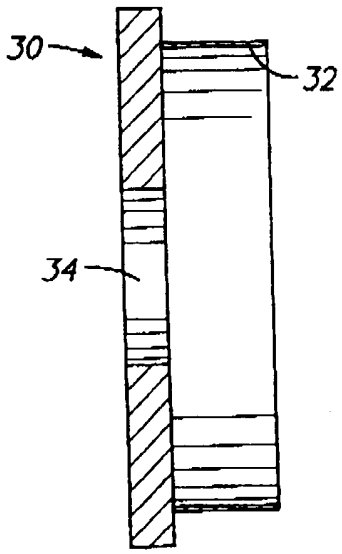

FIG. 4

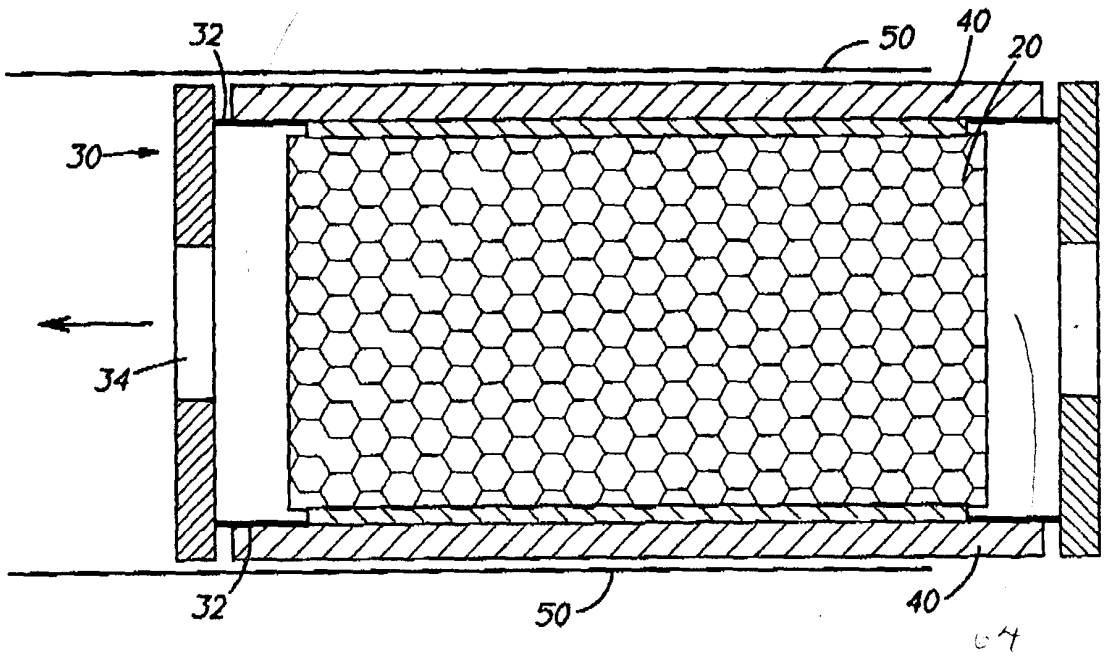


FIG. 5